ABSTRACT

A cellular radio system in which a base station receiver can receive, on the reverse link, data from a mobile terminal in one of four control modes. In the first mode, the mobile terminal sends an independent user pilot, not synchronized with the base station, on the reverse link and the user data channel is synchronized to this independent user pilot. In the second mode, the mobile terminal slaves its user pilot to the pilot it receives from the base station and the user data channel is synchronized with this slaved user pilot. This second mode allows the user terminal to receive round trip delay information for purposes of geolocation and rapid reacquisition. In the third mode, the mobile terminal slaves its user pilot to the incoming base station pilot, as in the case of mode two, but the user data channel operates in the orthogonal mode using the ranging information received from the base station. The phase relationship between the user pilot channel and the user data channel is calibrated. The user pilot carrier is also the carrier for the user data channel and can be used as the carrier reference for detecting the user data channel. In the fourth mode, the slaved pilot implementation of mode three is used for acquisition but, after acquisition, the user pilot code is phase shifted to be synchronous with the user data channel, thus also making it an orthogonal channel. In this mode, the pilots no longer contribute interference to the user data channels, within the cell, and can be transmitted at higher power levels.

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